

CLEAN VERSION OF THE AMENDED AND ADDED CLAIMS

IN THE CLAIMS:

Claims 1-7: Cancelled.

8. (First Amended) A method of manufacturing a multi-layered barrier metal thin film by atomic layer chemical vapor deposition, comprising the steps of:

providing a substrate in a reactant chamber;

providing a first chemical species in said reactant chamber;

providing a second chemical species in said reactant chamber, wherein said first and second chemical species react to deposit a first layer of a barrier metal thin film of a first metal nitride on said substrate by atomic layer chemical vapor deposition;

providing a third chemical species in said reactant chamber; and

providing a fourth chemical species in said reactant chamber, wherein said third and fourth chemical species react to deposit a second layer of said barrier metal thin film of a second metal nitride on said first layer by atomic layer chemical vapor deposition, wherein said second metal nitride is different from said first metal nitride,

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wherein said barrier metal thin film deposited on said

substrate defines a thickness of less than 100 Angstroms.

10. (First Amended) The method of claim 8 wherein said thickness of said barrier metal thin film is equal to an atomic thickness of said first and said second metal nitrides.

(11. Cancelled.)

12. (First Amended) The method of claim 8 wherein said first layer of said barrier metal thin film and said second layer of said barrier metal thin film are each chosen from the group consisting of TiN, TaN, W, WN and Si₃N₄.

14. (First Amended) A method of manufacturing a multi-layered barrier metal thin film by atomic layer chemical vapor deposition, comprising the steps of:

providing a substrate in a reactant chamber;

providing a first chemical species in said reactant chamber;

providing a second chemical species in said reactant chamber, wherein said first and second chemical species react to deposit a first barrier metal thin film of a first metal nitride on said substrate by atomic layer chemical vapor deposition;

providing a third chemical species in said reactant chamber;

providing a fourth chemical species in said reactant chamber, wherein said third and fourth chemical species react to deposit a second barrier metal thin film of a second metal nitride on said first barrier metal thin film by atomic layer chemical vapor deposition, wherein said first metal nitride is different from said second metal nitride.

21. (Newly Added) A method of manufacturing a multi-layered barrier metal thin film by atomic layer chemical vapor deposition, comprising the steps of:

providing a substrate in a reactant chamber;
depositing a first layer of a first metal nitride on said substrate by atomic layer chemical vapor deposition; and
depositing a second layer of a second metal nitride on said first layer by atomic layer chemical vapor deposition;
wherein said first metal nitride is different from said second metal nitride.

22. (Newly Added) The method of claim 21 further comprising depositing a third layer of a third metal nitride on said second layer by atomic layer chemical vapor deposition, wherein said third metal nitride is different from said first and said second metal nitrides.

23. (Newly Added) The method of claim 21 wherein said multi-layered barrier metal thin film deposited on said substrate defines a thickness of less than 100 Angstroms.

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24. (Newly Added) The method of claim 21 wherein said first and second metal nitrides are each chosen from the group consisting of TiN, TaN, W, WN and Si₃N₄.

25. (Newly Added) The method of claim 21 further comprising depositing a third layer of said first metal nitride on said second layer by atomic layer chemical vapor deposition, and depositing a fourth layer of said second metal nitride on said third layer by atomic layer chemical vapor deposition such that said multi-layered barrier metal thin film comprises alternating layers of said first and second metal nitrides.
